

**REPORT TO THE
49TH
MONTANA LEGISLATURE
ON THE
RENEWABLE ENERGY
AND
CONSERVATION PROGRAM**

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Background

In 1975, the Montana Legislature adopted the nation's first state-funded financial incentive program to develop emerging renewable energy technologies (see Appendix A). The program's stated purpose was to decrease Montana's reliance on non-renewable fossil fuels, and increase the use of solar, wind, biomass, geothermal, and small-scale hydro renewable energy sources. Funded by a percentage of coal severance tax revenues, the program provided for the research, development, and demonstration of these energy sources.

The Legislature assigned the Montana Department of Natural Resources and Conservation (DNRC) to administer the program. DNRC began issuing grants to individuals and businesses in 1976. In its first few years, the program concentrated heavily on solar technologies. But as more emphasis was placed on individual energy technologies, new competition for the renewable energy grants developed. Technologies for a variety of renewable energy sources matured at the same time the program was coming under closer scrutiny by the Legislature and the public. This interest was especially high because the coal severance tax funded the program.

The program's original legislation has been changed twice since its adoption, first by the 1981 Legislature and then by the 1983 Legislature.

The first 1981 legislative change established a loan program to stimulate the fledgling renewable energy industry and thus give a broader range of Montanans an opportunity to choose from a variety of commercial renewable energy options.

The second 1981 legislative action lowered the percentage of the coal severance tax that was allocated to fund the program from 5 percent to 4.5 percent. However, because coal tax revenues have been increasing, this change has not actually resulted in fewer dollars going to fund the program.

The third 1981 legislative change, and in fact the second one as well, reflected a dissatisfaction among the majority of legislators with the administration of the program to that point. Many legislators believed that there had been no demonstrable reduction of the state's reliance on fossil fuels. Changes surfaced about favoritism in issuing grants, and about too much emphasis on solar technologies that benefited only a select group of "insiders." In addition, many legislators felt a lack of grant follow-up, reporting, and financial accountability detracted from the program's effectiveness.

Within this context, Representative Joe Quilici (D-Butte) sponsored HB 398 in the 1981 session, which sought to correct these deficiencies and tighten administration of the program. The bill

limited the funding of demonstration projects to those with good potential for saving non-renewable energy, and prohibited funding those demonstration projects similar to unproductive projects in close geographic proximity to a similar project, and those projects that did not fit within the goals of the statute. In addition, the legislation required DNRC to monitor grants and loans and report to the Legislature on the effectiveness of funded projects or programs. Representative Quilici's bill also required DNRC to submit periodic reports to the Environmental Quality Council (EQC) for review and evaluation, and directed the EQC to make recommendations to assure the greatest possible benefit from the program to the people of the State of Montana.

The latest legislative action took place in the 1983 session. Senator John Mohar (D-Libby) sponsored SB 356, which sought to clarify project eligibility for grants and loans from the alternative energy research development and demonstration account, to provide for the inclusion of research, development and demonstration of energy conservation, and to remove the prohibition on private ownership and control of research information. This action was prompted by DNRC's observations that energy conservation activities were not formally considered under the REGAL program, and that many individuals were withholding attractive grant proposals for fear of losing patent rights to alternative energy technologies. SB 356 was enacted in 1983 to address these changes (see Appendix A). At its inception, the REGAL program was explicitly mandated only to explore and develop

renewable energy options. The legislature initially considered energy conservation activities as separate developments and felt that adequate efforts already existed in this area. As the REGAL program developed, however, DNRC found that renewable energy development and conservation activities were often closely interrelated. Tying conservation techniques to renewable energy generation would induce both efficiency in energy consumption and alternative energy development.

Purpose

The purpose of this report is to review actions by DNRC addressing the latest amendment and now-completed activities initiated by the previous amendments, and to update EQC oversight activities. Conclusions and recommendations are also included. This report will not concentrate on details of the program, such as specific projects funded or eligibility requirements. DNRC's publications and report to the Legislature adequately provide this information.

DEPARTMENT OF NATURAL RESOURCES ACTIVITIES

Sustainable Energy Assessment (SEA) Project

As a result of the criticisms emerging from the 1981 session, DNRC has made efforts to establish clear, concise goals and objectives for the program and to devise a system for measuring the attainment of those goals and objectives. This has been largely accomplished by the completion of the study entitled the Sustainable Energy Assessment (SEA). SEA helps determine the end-use of energy generated in Montana

and will direct the program's resources to where they will be most effective. The SEA program represents an initial effort needed to provide technical information upon which Renewable Energy and Conservation (RECP) program planning can be based. By determining which concepts of sustainable energy and conservation development in Montana would be most cost-effective, a working framework for judging proposed contracts will be provided.

The completed SEA study includes:

- 1) future needs on diesel fuel substitutes and extenders;
- 2) evaluation of agricultural and food processing waste streams as a source of alcohol feedstock;
- 3) high-head small-scale hydro resource assessment;
- 4) power generation potential of ungaged streams in the mountains and high plains;
- 5) Montana Wind Energy Atlas;
- 6) Bureau of Reclamation/DNRC wind monitoring program;
- 7) commercial sector survey to estimate its potential for conservation;
- 8) projections of residential wood fuel use;
- 9) solar domestic hot water analysis; and
- 10) oilseed resource assessment.

Descriptions of these studies are included in greater detail in DNRC's report to the Legislature and are attached in the Appendices. The SEA study will not limit grants and loans to only those projects listed; it does not represent the entire basis for planning criteria. SEA is

only a part of a continuing process used by DNRC to formalize its planning procedure, and to incorporate its elements, and subsequent criteria, into its grant and loan decision framework. DNRC plans to continue building on this information so the director can make grant proposal decisions on a more informed basis as to their feasibility. In this fashion, DNRC can focus more on the commercialization of renewable energy sources. The department believes that the SEA and subsequent studies will allow it to do this more effectively.

There has been a trend toward Requests for Proposals (RFP's), which are solicited grants by DNRC. Based on information provided by SEA-type studies, DNRC has increased the number of RFP's, as the department believes these projects will prove most cost-effective and are closer to commercialization. The department still maintains its separate grant cycle, which provides funds for unsolicited grant proposals. To date DNRC has indicated that enough funding has been available to service qualified but unsolicited proposals as well as projects solicited through RFP's. Total grant and loan applications have declined, but DNRC considers this a natural occurrence due to the attrition rate of marginal renewable energy developers, the state of the economy, and the increasing focus on commercialization. The SEA project and subsequent studies indicate the program's preference for RFP's. If DNRC bases these RFP's on technical feasibility and commercial potential, this will require participation by firms with access to adequate technical and financial resources.

Most of the action taken by DNRC on the REGAL program (now RECP-the Renewable Energy and Conservation Program) resulted from the recommendations made by the Legislative Auditor in 1981. The REAC committee was generally pleased with DNRC's response to these recommendations, but the Legislative Auditor's office has done no further research on DNRC's energy grant programs.

In the meantime, DNRC's Energy Division has taken several steps on its own to refine the programs. First, it has developed a Final Report Library as part of its public information thrust. All RECP-related published materials will be available through the state's inter-library loan system or DNRC's own Final Report Library. Many documents are disseminated through mailing lists to contractors, customers, and distributors at fairs and workshops.

DNRC recognized the need for a systematic distribution of its research-generated information. As a step in this direction, DNRC completed a marketing study to determine the Montana public's awareness level on renewable energy and conservation programs. The marketing survey clearly points to the need for a public information and education program; consequently, the findings were incorporated in the department's program planning process during the spring and summer of 1983. A summary of the marketing study and its conclusions appears in Appendix B.

A second effort to refine the program involves DNRC analysis of loans that failed for various reasons. Such a study would reveal possible weaknesses in the application review process. These

weaknesses could result from technical impracticalities, poor marketing, poor credit structure, or other causes. The state of the economy has caused a decline in applications, but a more effective liaison between the banks and DNRC would lessen the effects of this factor. DNRC recognizes that weaknesses exist and plans to update its review of the application process upon study completion.

Finally, DNRC plans to uphold its mandate of informing and involving the public to the greatest extent possible by changing the method of review on information grants. Because of increased technical information, DNRC has increased its focus on solicited grants through its SEA process and general program direction. However, it does not want to discourage innovative ideas that may not be included in the plans for solicited projects. Therefore, it will encourage inventors, entrepreneurs, and others to send in 3 to 4-page abstracts of ideas which could be developed to better inform Montanans through the department's Information Section. These ideas could then be reformulated as RFP's, independent of the grant cycle, and sent out for solicitation. For example, a high school science teacher may have an innovative idea for developing a renewable energy resource or conservation method. He or she may not have the time, money, or inclination to develop the concept, but may wish to see further study on the idea done by someone else. After submittal of the abstract to DNRC, the Department analysts could expand it into a workable project.

Conservation

As a result of the 1983 amendment providing for conservation grants, the DNRC Energy Division plans to allocate 30% to 40% of its grants and loans to conservation projects. With information derived from the SEA and related studies, DNRC will focus on conservation ventures moving toward commercialization. This would accomplish two things. It would address the earlier criticisms that renewable energy and conservation were not interrelating and it would more adequately address the mandate given DNRC by the Renewable Energy Act by further helping Montanans to decrease their dependence on fossil fuels.

An effort on this behalf involves the BPA-funded superinsulated home program. Referred to as the Residential Standards Demonstration Program (RSDP), this plan is a direct result of the Northwest Power Planning Council's mandate to identify future electrical energy needs of the Pacific Northwest and how these needs could be met most effectively. Assuming that it is cheaper to build energy-efficient homes than to build new power plants, the Council directed the Bonneville Power Administration to encourage adoption of Model Conservation Standards. In general, the RSDP provides incentives for the construction of approximately 100 superinsulated homes in Montana (for complete details on the program, see Appendix D), and the BPA has asked DNRC to assist in implementing the program to ensure that the data gathered in Montana are consistent with the rest of the region. The objectives of the RSDP are:

- o to identify how much more it will cost to build

energy-efficient homes;

- o to identify how much energy these homes will actually save;
- o to give a broad cross-section of the home-building industry experience in building energy-efficient homes; and
- o to inform people about the advantages of energy-efficient homes.

Because the Bonneville Power Administration is providing the funding, houses must be located within the BPA service area to be eligible. Many homes are under construction, and program results will soon be available.

In April of 1984, DNRC signed a contract with the National Center for Appropriate Technology (NCAT) in Butte to provide research, monitoring, training, and demonstration of superinsulated construction in Eastern Montana -- an area that is not part of the Bonneville Power Administration's service territory. The 20-month contract will expose members of eastern Montana's building and financial community to the techniques involved in superinsulated construction, while gathering solid research data on the incremental costs associated with superinsulation. NCAT will develop the program from both a consumer education and a building training approach.

It appears that DNRC has embraced the conservation facet added in the 1983 session. From fiscal year 82 to the present, 65 grants, contracts and loans have been awarded totaling \$4,103,910. In fiscal

year 84, three conservation grants were awarded totalling \$290,000. The bulk of the later figure was reflected in the NCAT grant. RSDP figures are not included, as this funding came from the BPA.

Conclusions and Recommendations

The Department of Natural Resources and Conservation's Renewable Energy and Conservation Program is progressing smoothly toward sharpening its focus. At present the DNRC sees no need for amending legislation to clarify further the RECP mandate, and EQC concurs with this appraisal. However, public knowledge of the RECP program must expand, and the banking community's enthusiasm for the loan program would increase with expanded involvement. It is hoped that DNRC will respond to EQC's recommendations as it has in the past and move closer to the goal of less dependence on fossil fuels and more emphasis on the possibilities of renewable energy sources and conservation techniques.

EQC Recommendations

1. EQC recommends that DNRC publish and distribute the minutes of the REAC meetings. This will help EQC in its oversight function mandated in 90-4-108 MCA. Without public access to the minutes of these meetings, project accountability is not maximized.
2. EQC recommends that the DNRC forward all available RECP documentation on a regular basis to EQC. This will reduce duplication of effort and will lead to better rapport with, and thus the support of, the Montana Legislature.
3. The marketing survey clearly points to the need for a public

information and education program on energy and conservation related activities. DNRC's Energy Division efforts in this behalf have been noted. EQC recommends that these efforts be expanded to include a more systematic method for distribution of this information. EQC offers its assistance on such a project. The Northwest Power Planning Council's energy conservation program has made extensive efforts to inform the public, and DNRC could coordinate with that information dissemination system.

4. EQC recommends that DNRC establish a formalized procedure to ensure the banking community's effective involvement in the RECP program, and to educate bankers on its merits. EQC feels that inclusion of a representative from the financial community is imperative for the success of the loan program. If DNRC coordinated more closely with the banks, it would:

- 1) cut down on the risk of defaults;
- 2) open up more money for more RECP projects;
- 3) save the state and its taxpayers money; and
- 4) encourage a more favorable bank-to-DNRC funding ratio as a result of the reduced risk.

This can be accomplished by the inclusion of an additional step in the loan application process. In this step a DNRC representative would meet with the banker and discuss the merits of the technology involved, the type of financing appropriate for that particular loan, and any other points that need clarification

between the two parties. EQC also recommends that DNRC initiate a study on the feasibility of third-party options, such as shared savings and third-party leasing, as financing options (see Appendix C, which includes a text of a speech which expands on DNRC's objectives in establishing rapport with the banking community).

5. EQC proposes to continue to monitor the application review procedure and DNRC's planned updates. EQC requests that DNRC send it periodic progress reports in this area.
6. The encouragement of information grant proposal abstracts is a good idea. EQC recommends that DNRC establish a procedure to involve the Montana public in submittal of such abstracts. Abstract solicitation could be encouraged through college and high school science programs, science fairs, workshops, and contests, with awards offered as incentives.
7. DNRC should submit to EQC its preliminary environmental reviews on a timely basis. While all the RECP (formerly REGAL) projects are potentially beneficial to certain aspects of environmental quality, some may have significant negative environmental impacts as well. Under its MEPA mandate, EQC is interested in evaluating the overall environmental effect of these projects.
8. DNRC should actively seek support from utilities outside the BPA power system for funding an RSDP program to complement the BPA funded program. With the results of the initial RSDP activities, DNRC should be able to persuade other utilities in the state of the RSDP advantages.

Appendix A

SUSTAINABLE ENERGY ASSESSMENT (SEA) PROJECT

FINAL REPORT

Energy Division

Department of Natural Resources and Conservation

March, 1984

INTRODUCTION

The Energy Division, Department of Natural Resources and Conservation (DNRC), has conducted a series of 10 studies, known collectively as the Sustainable Energy Assessment (SEA) Project, to assess the potential of different aspects of energy conservation and renewable energy in Montana. DNRC was particularly interested in developing better means for directing the Renewable Energy and Conservation Program (RECP), which is funded by the coal severance tax. DNRC also wished to use the results of SEA in planning the state energy conservation programs, and in performing the analysis of energy needs and possible alternative sources required by the Major Facility Siting Act as part of the evaluation of proposed energy projects. SEA studies also were designed to be of use to private sector development of sustainable energy resources. The SEA Project concentrated on studies of general feasibility and estimates of potential that were of immediate and middle-term interest as determined by DNRC and private sector experts.

HISTORY OF SEA

SEA was structured to meet DNRC's planning needs as the department initiated the process of revamping and improving the RECP. It was undertaken to support a specific development and demonstration program. This tight focus differs from earlier studies of renewable energy futures done elsewhere, such as Distributed Energy Systems in California's Future, and by study proposals previously developed by DNRC. SEA was to be the initial, major effort needed to provide technical information on which program planning could be based. DNRC expected that assembly of this information would provide the nucleus for the routine planning and analysis work that would provide the necessary and continuing technical guidance to the RECP in the future. Other aspects of program planning, such as market research and administrative rules revision, were conducted at the same time as SEA.

The concept of SEA was developed in August, 1981. The project began in late January 1982. The first step was a series of meetings within the Department and with private sector and university experts in sustainable energy. These discussions produced a list of 40 studies for which there was both a need and a high interest in Montana. Of these suggested studies, 21 were assigned to SEA, 7 were to be covered by analyses required under the Major Facility Siting Act, and 12 were proposed for or were being conducted through other federal and state programs. Thus, SEA was one of several DNRC research efforts on sustainable energy.

Ultimately, ten of the twenty-one studies proposed for SEA were undertaken. All the studies looked specifically at Montana conditions. The "Oilseed Resources Assessment" analyzed native and cultivated plants that are sources of vegetable oil, which can be used as a substitute or extender of diesel fuel. "Future Research Needs on Diesel Fuel Substitutes and Extenders" suggested priorities for agronomic and chemical engineering studies of vegetable oil. The possibility of turning bad seed grain, cull potatoes, and other agricultural and food wastes into alcohol was studied in the "Evaluation of Agricultural and Food Processing Waste Streams as a Source of Alcohol Feedstock". The flow characteristics of small streams in northwestern Montana and the upper Yellowstone valley were measured in "High-head Small-scale Hydro Assessment." A procedure for estimating the flow characteristics of ungaged streams from available data was developed in "Flow-Duration Curve Estimation Procedure." The Montana Wind Energy Atlas summarized existing wind data

in a standard format. The "Bureau of Reclamation/DNRC Wind Monitoring Program" is gathering new data on potential wind farm sites. With the "Commercial Sector Conservation Survey Methodology," DNRC developed a more economical and statistically defensible way of estimating the energy conservation potential in commercial businesses. The amount of wood to be burned in homes over the next ten years will be estimated in "Projections of Residential Wood Fuel Use." The computerized model from the "Solar Domestic Hot Water Analysis" calculated the economics of solar systems. The results of the individual studies are summarized in Appendix A.

Several studies were not performed because of time constraints and other reasons, primarily the continuing postponement of a completed application under the MFSA for the proposed Salem facility. (These studies originally were intended to be carried out in conjunction with preparation of the Salem EIS.) Therefore, SEA's scope was smaller than planned and only \$159,853, of the \$332,404 budget of SEA (\$115,507 of the \$250,000 appropriated from the coal tax funds) was spent as of November 1983. The major remaining expense is the Projections of Residential Wood Fuel Use, budgeted at \$36,580, of which \$30,000 is provided by DOE. This study, begun in December 1983, was delayed while DNRC sought authorization from DOE and the legislative finance committee to spend the funds.

USE OF SEA

Results of SEA studies available by last spring were incorporated into the Conservation and Renewable Energy Bureau's FY84 planning process. Eleven projects derived from SEA were included in the FY84 workplan (see Appendix B). This year, the results of SEA formed the major technical contribution to the planning process, along with the results of previous grants and suggestions from the bureau engineers. Also, the Planning and Analysis Bureau is incorporating some SEA results into the revision of the Major Facility Siting Act rules.

Other agencies and the public also will benefit from the information developed. For example, both DNRC's Water Rights Bureau and the U.S. Fish and Wildlife Service have used the flow duration study to estimate stream flows. The Public Service Commission has recommended that Montana-Dakota Utilities consider using the solar hot water simulation model in the PSC-mandated solar hot water feasibility study. Portions of the commercial sector conservation survey methodology have been adopted by Pacific Gas and Electric and by the Electric Power Research Institute. The annotated bibliography to "Future Research Needs on Diesel Fuel Substitutes and Extenders" is being used for classwork at MSU.

All reports from SEA, with the exception of those from "Future Research Needs on Diesel Fuel Substitutes and Extenders" and "Evaluation of Agricultural and Food Processing Waste Streams as a Source of Alcohol Feedstock," are, or will be, published or made available to the public through public libraries. The two exceptions are available as file copies at DNRC.

Appendix A. Summary of SEA Studies

Oilseed Resource Assessment

Vegetable oil is a potential substitute for diesel fuel. This study sought to identify sources of vegetable oil in Montana. Native and naturalized Montana species with potential as oil-bearing plants were inventoried. Eighteen of the most promising oilseed species and twenty-seven of the most promising whole-plant-oil species were selected for field sampling. Field samples were analyzed for oil, protein, fiber, ash, moisture, carbohydrates, and total digestible nutrient levels. Investigated species were placed into priority groupings for further research. Priority was based principally on oil content, but feed quality, toxicity, and agronomic potential also were considered. Seven native or naturalized species (prickly poppy, snow-on-the-mountain, spatula-leaved spurge, small-flowered gaura, dyer's woad, prairie sunflower, and Jim Hill--or tumble--mustard), showed high potential for seed oil. Five native or naturalized species (rubber rabbitbrush, field sagewort, showy milkweed, curly-cup gumweed, and stiff goldenrod) showed potential for whole-plant oil. Since many of these species are considered weeds, future work with them must proceed carefully. Greater potential may lie with the development of currently cultivated food oil crops (such as mustard, rapeseed, safflower, sunflower, flax, and crambe) as fuel oil crops. An analysis of the results of field trials at agricultural research centers in Montana suggested that the breakeven price for vegetable food oil production in Montana ranged between \$2.00 and \$4.00 per gallon in fall, 1982. Diesel fuel was then \$1.00 per gallon. The relative difference in prices, though significant, is encouraging, given the preliminary nature of research on vegetable fuel oil. The difference is less than has been the case with many other renewable resources at this stage of development.

The results of this study are included in DNRC's Renewable Energy Report Library, available through the public libraries January 15, 1984.

Future Research Needs on Diesel Fuel Substitutes and Extenders

Both the literature and capabilities of Montana research facilities were reviewed to develop priorities for research on diesel fuel substitutes and extenders appropriate to Montana. The review of the literature covered oil production and economics, processing technologies, and engine testing. The review of research facility capabilities showed that most of the relevant equipment and personnel are located at Montana State University and its affiliated agricultural research centers. Some research capabilities can be found at the other campuses, and in the private sector, such as Continental Seed and Grain, Culbertson. Burlington Northern has supported research on the use of vegetable oil in diesel locomotives, though not in Montana. Twelve research projects, some running through 1986, in biological studies, chemical process studies, and utilization research were identified as warranting a high priority.

The Energy Division used this report to direct further energy research.

Evaluation of Agricultural and Food Processing Waste Streams as a Source of Alcohol Feedstock

Dealers and processors of grains, potatoes, seeds, and other food materials were surveyed to determine how much and what kind of waste they generated. Because Montana grain growing practices result in relatively little dockage (i.e., waste), supplying an alcohol plant with dockage from grain elevators and dealers, did not appear to be economically feasible in Montana. The small scale and dispersed nature of the other types of firms surveyed makes it unlikely that a plant could be profitably run off their waste, unless transportation costs to a central facility could be significantly reduced. Based on these findings, the proposed laboratory analysis of the waste was canceled.

This evaluation was used by the Energy Division for assessing areas of future study.

High-head Small-scale Hydro Resource Assessment

The United States Geological Survey (USGS) is cooperating with DNRC in conducting streamflow measurements on small streams that might be suitable for small-scale hydroelectric plants. The USGS will develop average flow-duration curves based on a year's field measurements. Fifty sites on 40 streams are being studied in the area north of Missoula and west of the Swan mountains. Another 21 sites on 17 streams are being studied in the upper Yellowstone valley. Specific conductivity and pH also are being measured.

The results of the northwest study will be available as a USGS publication in June 1984. The results of the Yellowstone study will be available as a DNRC publication in June 1984. Both publications will be placed in public libraries.

Flow-Duration Curve Estimation Procedure

There has been no flow measurement on most streams that might be suitable for small-scale hydroelectric development. In this study, a procedure for estimating flow-duration curves was developed to permit quick preliminary assessment of the power generation potential of ungaged streams in the mountains and high plains. This estimation procedure is based on topographical maps and precipitation data. The procedure was calibrated with Montana data and is specific to the state. It permits more efficient identification of sites warranting field studies and a preliminary assessment of the feasibility of proposed projects. It also is of use for determining stream flow for water rights.

The procedure developed in this study is explained in a report of the Water Resources Research Center, Montana State University.

Montana Wind Energy Atlas

A number of agencies and organizations have collected wind speed and direction data for a variety of purposes. Data were obtained from these groups for 149 sites, 50 of which were analyzed for inclusion in the Atlas. These 50 sites were selected on the basis of the quality of the data and/or the amount of other data available in the general region. The Atlas contains descriptions of each site and the results of the analysis. Monthly wind speed distributions and wind power were calculated for

each site. The 14 sites having an average annual wind speed of over 11 miles per hour (mph) received a more extensive analysis, covering diurnal wind speed frequency distributions by season, and wind speed distributions by direction (including wind rose graphics). Weather Hill, near Anaconda, had the highest average annual wind speed with 17.0 mph; however, since the data is not of highest quality, and the site is small, with difficult access, Weather Hill may not be the best wind farm site in the state. The DOE Candidate Wind Turbine site at Livingston had 15.6 mph and Judith Gap, 13.1 mph. Data from some sites in eastern Montana, such as near Scobey (11.6 mph) and Billings airport (11.0 mph), suggests that the wind energy potential there may be greater than was previously assumed. In general, the Atlas points up the current paucity of data on sites with high wind energy potential. The Atlas also describes the different wind measurement programs in Montana and discusses the use of different power law factors to extrapolate wind data to heights other than that at which the measurement was taken.

The results of this study will be available June 1984 as a DNRC report.

Bureau of Reclamation/DNRC Wind Monitoring Program

The Bureau of Reclamation entered into a cooperative agreement with DNRC to continue a wind monitoring program the Bureau had begun. DNRC took over the management of equipment sited near Choteau, Highwood, and Cut Bank, and moved a fourth set of equipment to near Drummond. Data summaries for the 1982-83 year are not yet available. The previous year showed Cut Bank had an average annual windspeed of 13.1 mph, Highwood with 10.5 mph, and Choteau with 10.3 mph. The equipment was moved this fall to new sites chosen by DNRC to continue the monitoring program.

The results of this study are available on a quarterly basis from Bureau of Reclamation Billings office.

Commercial Sector Survey Method

Estimating the conservation potential in the commercial sector is difficult due to the sector's great heterogeneity in size and end-use. Previous studies have relied on expert judgment to select a limited number of buildings to serve as prototypes, representing all the buildings in the study area. The conservation potential of these prototypical buildings then were analyzed and the results generalized to be applicable to all the buildings in the study area. Because the representativeness of these prototypes is unknown, the accuracy of such estimates cannot be measured. As an alternative estimation method, DNRC developed a multi-phase stratified sampling approach based on standard statistical methods. In one phase of this study, DNRC proposes to survey 500-1,000 commercial businesses to determine the square footage of their floorspace. In the other phase, the main phase, these businesses or buildings would be grouped on the basis of their annual electrical consumption. A limited number of buildings from each group (total number, around 100 buildings) would be sampled with a known and acceptable range of statistical accuracy and their conservation potential would be analyzed using currently available computer models. The results would then be generalized back to

all the buildings in the study area based on the relationship of their square footage to total commercial floorspace. The innovative aspect of the DNRC approach is the creative use of statistical methods to permit a relatively small--and therefore economical--sample size.

A report on the procedure developed in this study is included in DNRC's Renewable Energy Report Library, available through the public libraries January 15, 1984.

Projections of Residential Wood Fuel Use

Wood fuel has provided a growing proportion of residential heating for the last few years. Future changes in the amount of wood use will affect the need for additional conventional energy supplies. The amount of wood used also will influence the amount of air pollution experienced by certain areas in Montana. This study will develop wood use projections at least for the period 1984-1994. Because of difficulties in receiving DOE authorization to spend the federal funds allocated for this project, DNRC was not able to sign the project contract until December. The study will be completed in June, 1984.

Solar Domestic Hot Water Analysis

DNRC developed an easy to use solar domestic hot water (SDHW) computer program written in BASIC and designed to run on commonly available microcomputers. The DNRC program is based on the FCHART method, a widely accepted approach for simulating the performance of an SDHW system. This allows comparison of the predicted economics of solar and conventional hot water systems. Thirty sites have been ranked on the basis of solar thermal potential, determined by local insolation (amount of solar radiation), and on the economic potential of an SDHW system, which depends both on local insolation and on local utility rates. Using the best available economic forecasts, lifecycle costs of SDHW systems generally appear lower than those of electric hot water systems, and higher than those of natural gas systems.

The results of this study are included in DNRC's Renewable Energy Report Library, available through the public libraries January 15, 1984. It already has been used at fairs and in public demonstrations as part of the Division's outreach efforts.

Appendix B: SEA and the Planning Process

The results of the SEA studies were a major contribution to the Conservation and Renewable Energy Bureau's FY84 planning process. The staff used the SEA studies findings on economics, resource availability, commercial potential, and so forth in setting priorities for the FY84 program. Eleven projects based on the results of SEA were included in the FY84 workplan. The staff recommendations for the projects are listed below under the title of the SEA study pertinent to each. Brief explanations of the recommendations are included where appropriate.

Oilseed Resource Assessment

Future Research Needs on Diesel Fuel Substitutes and Extenders

1. Conduct laboratory studies on the polymerization of lubricating oil by vegetable oils.

Vegetable oil that contaminates lubricating oil in a diesel engine can cause the engine to "freeze-up." Laboratory research to solve this problem should be conducted in advance of large-scale fuel oil farming.

2. Conduct laboratory studies of transesterification of vegetable oils.

Another possible method for improving the quality of vegetable fuel oil is to create esters of the oils. These esters have better handling and combustion properties than straight vegetable oils.

3. Continue study of native oil plants.

The number of oil plant species in Montana is so great and their characteristics so varied that further research is needed to identify those best suited for development as fuel oil crops. The results of the Oilseed Resource Assessment will be used to target the species warranting further research.

4. Review previous oilseed data collections.

In the course of the Oilseed Resource Assessment, DNRC came across references to unpublished material collected as part of food oil studies in Montana. This material covered plant varieties that might have fuel oil potential. These data collections should be reviewed, and if the quality so warrants, data from them should be organized and published, thus saving considerable field research time.

5. Hold a seminar of oilseed breeders.

Development of fuel oil crops from food oil crops appears to be the quickest and most economical route for producing diesel fuel substitutes and extenders. A seminar of experts from outside Montana could prove useful by focusing future work in Montana on varieties that the experts suspect, but have not proven, to have potential as fuel oil. This seminar should be held before field studies are begun.

Alcohol from Agricultural and Food Processing Waste Products

6. Drop consideration of central alcohol production facilities relying primarily on waste products.

The amount of waste products available does not appear to justify further research in this area.

Montana Wind Atlas

7. Continue monitoring of sites with potential for wind energy development.

The Atlas showed the lack of data for areas that are suspected to have high wind energy potential.

8. Prepare brochure or handouts to inform the general public on the Montana wind resource.

The difficulties of compiling the Atlas showed how inaccessible most wind data currently is.

9. Study direct application of wind technology.

The wind resource on the Montana plains appears great enough to warrant investigation of advanced water pumping devices and space heating equipment.

Bureau/DNRC Wind Monitoring Program

10. Support further wind prospecting and development in Glacier County.

At 13.1 mph annual average wind speed, Cut Bank looks attractive from the perspective of wind energy development. DNRC should continue to participate on the review committee for the Blackfeet wind/conservation study.

Solar Domestic Hot Water Analysis

11. Release the computerized analysis program, with supporting documentation, to the general public.

Dissemination of the SDHW model will allow members of the general public to make informed decisions about purchasing SDHW systems.

Appendix B
MARKETING RESEARCH PROJECT
EXECUTIVE SUMMARY

I. INTRODUCTION

In July 1982, the Energy Division of the Department of Natural Resources and Conservation sent out a formal Request for Proposals, seeking a contractor to conduct marketing research for energy outreach programs. DNRC selected Economic Consultants Northwest, Ltd. (ECO Northwest), a company with broad experience in energy policy and with a background in survey work. ECO conducted the surveys during the fall of 1982 and performed the data analysis in early 1983. The final report was submitted to DNRC in May 1983. The findings were incorporated into DNRC's program planning process during the spring and summer of 1983.

II. BACKGROUND

DNRC had been considering a marketing research study since 1980. In early 1982, Energy Division staff decided it would be a good time to conduct the study, for several reasons. First, several new energy programs were being implemented in Montana through the Bonneville Power Administration (BPA). One program in particular, the BPA Technical Assistance to Small Consumers program, has a strong emphasis placed on public information. There is also an increasing emphasis on energy outreach and public information under Montana's Renewable Energy Program. Growing demands on staff time within the Information Section required development of more, standard energy information materials. Finally, the Division was working to implement a coordinated planning process between the various state, regional and federal energy programs, and needed an empirical base from which to determine program priorities.

These factors all pointed to a significant increase in energy information and outreach activities over the next few years. Because of the magnitude of this effort, DNRC believed it was time to better target its information activities, and chose to undertake the marketing research project to provide the information necessary for this targeting.

III. SURVEY RESULTS

Separate surveys were conducted for each of the following target groups: general public, farmers and ranchers, large businesses, builders, architects, lenders, appraisers, and realtors. The following information summarizes the conclusions for each survey, and outlines DNRC action resulting from the surveys. Anyone interested in more information on the surveys may obtain a copy of the final report for the marketing project. The report is approximately 400 pages, and is available from DNRC for \$15.35, which covers printing and postage charges.

A. General Public

More than 80 percent of the general public indicated that they had little familiarity with the energy audit and loan programs presently available through some utility companies in Montana. Approximately

13 percent of the respondents have had a home energy audit and 4 percent have utilized a utility company loan program.

Nearly 60 percent of the public indicated that they were very familiar with methods to prevent home heat loss, while less than 8 percent indicated that they had no notion of home heat loss prevention technologies. The method of energy conservation that received the second greatest percentage of very familiar ratings was superinsulation. During the telephone interviews there were comments that indicated both a skepticism and a lack of knowledge concerning the function and effectiveness of superinsulation. This is illustrated by the approximately 29 percent responses who claimed no familiarity with the concept. Fewer than 30 percent of the respondents indicated a strong familiarity with energy-efficient appliances or furnace efficiency. The data indicate a considerable need for greater public awareness concerning all of these home energy conservation measures.

Many of the respondents indicated specific home energy conservation measures had already been taken and in many cases these measures were implemented because of the increasing cost of energy. Eighty-two percent of the respondents have or plan to install weatherstripping and 70 percent claim this action is due to the rising cost of energy. Many people may have installed weatherstripping to make their home impervious to insects or other pests. Seventy-nine percent of the respondents also indicated that they had or would install storm doors on their homes and 54 percent of the respondents took this action due to the rising cost of energy; other persons may have dual purpose storm doors to allow summer ventilation.

Sixty-nine percent of the respondents indicated that ceiling insulation had been or would be installed in their homes and 58 percent indicated that wall insulation had been or would be installed. Relatively small percentages (14 to 35 percent) of the respondents had an interest in insulated window covers, fireplace inserts and hot water heater and pipe wrapping. A great deal more public information and awareness should be generated in these areas.

The major energy conservation measures taken by the public because of rising energy costs has been turning down the thermostat in the winter months. Seventy-five percent of the respondents indicated that they had turned down the thermostat by more than five degrees and 96 percent of these said the reduced heat levels were due to the rising cost of energy. Similarly, 54 percent of the respondents have lowered their hot water heater temperatures and 97 percent said the temperature reduction was due to the rising cost of energy.

There is a very strong interest in public energy education. More than 85 percent of the respondents indicated there should be a public energy education program but only 67 percent indicated they would participate. Although the respondents thought that utility companies and consumers should pay for this program, many respondents added they were certain the consumer would ultimately pay the bill.

While there has been a lot of news media coverage of renewable energy technologies, few people currently are making use of energy sources such as solar, wind, water or geothermal heat. Only 15 percent of the public indicated a strong familiarity with either wind or solar heating, and other renewable energy generation technologies were less well known. This is again an area of energy knowledge where the public is basically unaware and efforts to educate Montana could be well rewarded. The obvious visibility of solar heating devices is indicated by the fact that approximately 30 percent of the public indicated that they knew someone of the fewer than 3 percent of the public actually using solar heating.

Newspapers are the leading source from which the general public obtains information on energy conservation or renewable energy technologies. This is closely followed by magazines and then television. However, the usefulness of the information does not follow this same order. Magazines are generally perceived to be very helpful, television information follows in usefulness, and newspapers are third. These ratings may be due to the type of information presented.

Nearly 50 percent of the homes were classified as being over 20 years of age, which indicates the need for energy retrofitting and improving energy conservation measures in these older homes. Only 17 percent were identified as being less than five years old; consequently, there is a greater likelihood that they were constructed using energy efficient technologies. Obviously, as energy costs continue to rise, the need to inform the general public of energy conservation measures will become increasingly acute.

Information concerning energy conservation measures must be made available to homeowners and landlords. Twenty percent of the respondents indicated that they were renting their dwelling place. Thus one-fifth of the energy savings that could be realized is dependent on individuals who may not be paying the utility bills, or from another point of view, one-fifth of the total energy usage may be by renters who are not directly responsible for the condition of their home.

In summary, the public acknowledges a need for energy education. This need is illustrated by the extremely small percentages of persons who are aware of or who are using renewable energy sources. Somewhat less dramatic evidence of the lack of public awareness or interest in energy conservation is given by the 8 percent who have no knowledge of home heat loss prevention, and the more than 30 percent who have not and do not plan to install any additional home insulation, perhaps the simplest energy conservation measure.

B. Farmers and Ranchers

The response from the farmers and ranchers to the mail-out survey was exceptionally good. This strong response indicates a high level of

interest in energy conservation and an awareness of the potential savings through more efficient energy use. The statistical inferences drawn from this response also have enhanced reliability.

Montana farmers and ranchers indicated a strong familiarity (78 percent) with wind generated electricity and with distilling ethanol from grain (55 percent). In the areas of hydropower, crop residue fuel, ethanol protein by-products, and manure generated methane, their level of awareness was approximately 35 percent. Thus, they seem to be well informed concerning the most obvious and widely available sources of alternative energy generation on farms and ranches. In spite of this knowledge, only 10 percent are using wind generated electricity, 3 percent are using ethanol distilled from grain, and almost none are using any other type of alternative energy production technology. Furthermore, 65 percent have no plans to use wind generated electricity and even fewer plan to use any other type of energy generation.

More than 75 percent of the farmers and ranchers are aware that electricity they produce could be sold to their local utility. This fact has apparently not influenced their decision not to generate their own electricity. Quite possibly, other factors not investigated by this survey such as cost of production, limited availability of equipment, and lack of adequately trained technicians, have influenced their decisions to be uninvolved at this time.

In the areas of wind-powered stockwater pumps and efficient farm equipment sizing, the respondents not only rated their familiarity quite high (70-75 percent) but also indicated a high degree of present use (25-35 percent). Nevertheless, more than 60 percent indicated they did not plan to use wind-powered stockwater pumps. Thus, there is considerable opportunity to increase this use of wind-powered pumps and increase the use of energy efficient irrigation systems since over 60 percent of the respondents also indicated they did not intend to use these either. Of course, this 60 percent should be reduced by the number of farmers and ranchers who will not use irrigation of any kind.

Very high percentages (65-75 percent) of farmers and ranchers rated these three technologies (wind pumps, efficient machine sizes, and efficient irrigation) as being highly cost-effective. Approximately 60 percent rated wind-generated electricity as cost-effective but a much smaller percentage (35 percent) rated hydropower and manure methane as cost-effective.

Farmers and ranchers clearly rated the Montana Farmer-Stockman as the most informative source for information on conservation and renewable energy. Cited by 84 percent of the respondents, this publication exceeded the next most popular sources, the Montana Rural Electric News and daily newspapers, by approximately 20 percent. The radio and television stations were also cited by over 50 percent of the respondents as sources of information on conservation of energy.

C. Small Businesses

The most popular energy conservation measures among those involved in small businesses are those measures that are the easiest to implement, with 75 percent decreasing the winter thermostat setting and 60 percent installing caulking and weatherstripping. Fifty percent also reported installing insulation, closing off unused areas of their building, and increasing summer thermostat settings. Again, the higher technology procedures had been taken by fewer than 10 percent of the respondents. This included installing heat recovery devices, computer controls, solar heating, and clock controlled thermostats.

It is significant to note that 80 percent of the small businessfolk have attended a workshop or meeting dealing with energy conservation during the past year, but only 70 percent would be willing to attend another such meeting. These figures are the inverse of those reported by large businessfolk where the percentages were 60 percent and 90 percent, respectively. Forty-five percent indicated participants should pay for the workshops and 27 percent believed the utility companies should pay.

The sources of energy information most frequently cited by the small businessfolk include magazines, newspapers, and television (65 to 75 percent). Civic organizations and energy workshops were the least mentioned source of energy information (20 percent). Professional associations were also cited (50 percent) but not nearly as frequently as by the respondents in large businesses.

Sixty-five percent of the respondents own the building in which their business is located and 68 percent of the buildings are heated by natural gas. Eighty percent of the respondents indicated that they were owners of the business.

D. Large Businesses

The larger businesses in Montana are very aware of energy conservation. Frequently, large percentages of the respondents indicated a strong degree of familiarity with and use of energy conservation techniques in their places of business.

Nearly 40 percent of the businesses reported that an energy audit had been conducted and more than 75 percent have implemented energy management programs designed to reduce energy waste at the business. These major businesses also appeared to have a reasonable notion of the energy savings they have enjoyed due to the conservation measures they have taken.

Only 2 percent of the businessfolk interviewed said that they were unfamiliar with insulation, caulking, and weatherstripping. Ninety-four percent indicated a familiarity with heating system maintenance and modifications to obtain energy conservation and 79 percent indicated a familiarity with energy savings through lighting modifications. More than 50 percent indicated a lack of familiarity with solar heating.

Between 70 and 80 percent of the businessfolk are presently using decreased winter thermostat settings and reduced air infiltration methods at their facilities. Between 50 and 65 percent of the businesses have closed off unused spaces, insulated heaters, increased summer thermostat settings, modified lighting and installed additional insulation and double-pane windows. Approximately 35 percent have installed heat recovery devices and clock controlled thermostats. It is evident that as the degree of technology increases in the various energy conservation measures they become less widely used even in the major businesses. Only 15 percent are using computer controlled systems and fewer than 6 percent have installed any form of solar heating.

Additional actions that more than 70 percent of the businesses reported they have taken towards energy conservation include better vehicle maintenance scheduling, careful sizing of building heaters and boilers, and regular scheduled maintenance. Large percentages (more than 50 percent) also have purchased more energy-efficient vehicles and given special attention to the proper size and maintenance procedures for large machinery. In addition, 52 percent reported that they have an employee suggestion system directly related to energy conservation.

The cogeneration technique of generating electricity from process waste is unfamiliar to more than 70 percent of the businessfolk and is only being utilized by 2 percent at the present time. Waste heat recovery was rated somewhat higher with as many as 25 percent indicating utilization of this energy conservation technique.

It appears that professional meetings or workshops related to energy conservation measures would be well attended by representatives from major businesses if they were conveniently located. Sixty percent of the respondents had not attended any such meetings in the past year, but 90 percent indicated they would be willing to do so. Twenty percent of the respondents indicated the utility companies should bear the cost of such meetings and 40 percent believed the participants should be financially responsible for the workshops. The remaining 40 percent thought the cost should be split in some manner.

The relatively informed status of business representatives concerning energy conservation is largely due to the information they obtain from reading their professional publications, newspapers, and magazines. It would appear that in addition to energy workshops, further distribution of energy conservation information through the media and especially professional publications would be the most efficient way of reaching businessfolk with energy information. Civic organizations received the lowest rating for usefulness in delivery of energy information.

Three-fourths of the respondents identified themselves as managers or employees rather than as the owner of the business. This may

indicate that in many cases these businesses are national in scope and consequently their energy policies are determined and passed down from sources external to Montana.

E. Builders

Builders in Montana appear to be very traditional in their construction techniques with regard to efficient energy design strategies. In particular, the only two techniques that received high ratings for familiarity (75 percent) are use of standard insulation and multiple-pane windows. All other building and design techniques were mentioned by fewer than 20 percent of the builders, except for passive solar heating at 30 percent. Similarly, the only energy conservation techniques being used by more than 20 percent of the builders are triple-pane windows (50 percent), energy-efficient appliances (37 percent), and passive solar heating (30 percent). From this information one might conclude that 25 percent of the buildings presently being constructed in Montana have no conservation features beyond current energy code standards. Of the remaining 75 percent, very few have any more than standard insulation and double-pane windows.

Along the same lines, 50 percent of the builders estimated that fewer than 10 percent of the houses have energy-efficient appliances or triple-pane windows. In addition, more than 70 percent of the builders estimated that fewer than 10 percent of the buildings have superinsulation, solar heating, earth sheltering, high efficiency furnaces, air-to-air heat exchangers, or double envelope construction.

More than 40 percent of the builders believe that superinsulation, triple-pane windows, energy-efficient appliances, and high efficiency furnaces contribute a great deal to the salability of buildings. Thus, it appears that the builders know and understand the rationale in the use of energy-efficient construction but are not presently utilizing it either because of the construction costs or lack of customer specifications.

Approximately 40 percent of the builders design the homes they build and, in doing so, 80 percent of these builders use triple-pane windows as a selling point, 75 percent advocate energy-efficient appliances, 65 percent incorporate passive solar heating and approximately 50 percent emphasize superinsulation and high efficiency furnaces. Adding these features increases the cost of the construction by approximately 10 percent for over two-fifths of the builders.

More than 60 percent of the builders favored the adoption of an energy rating system similar to the EPA automobile mile-per-gallon rating system.

One-half of the builders indicated they had attended at least one workshop dealing with energy conservation during the past year; however, more than 90 percent would be willing to attend such a

workshop if available in their immediate area. Fifty percent thought the participants should pay for these workshops, 25 percent would bill the utility companies, and 12 percent would expect the government to provide the funding.

Builders presently rely very heavily (92 percent) on magazines to provide information concerning renewable energy and conservation. Their second most frequently cited source of information is professional associations (81 percent), with other sources such as energy workshops, newspapers, radio and television being mentioned as sources of information by no more than one-half of the respondents. In spite of this, they perceive workshops as being potentially the most helpful source of information (94 percent) and magazines are a close second (91 percent).

Sixty-four percent of the respondents indicated that they constructed residential buildings and more than 91 percent of the respondents indicated that they were owners of the construction firm.

F. Architects

Architects in Montana appear to follow patterns similar to those of the respondents in the builders survey, indicating their greatest familiarity with standard insulation (97 percent), multiple-pane windows (89 percent), passive solar heating (67 percent), and their least knowledge with more technical conservation measures such as high efficiency furnaces (19 percent), energy-efficient appliances (25 percent), air-to-air heat exchangers, and double envelope construction (31 percent). These similarities are further evidenced by those conservation techniques that have been used by the architects most frequently, which were passive solar heating (76 percent) and triple-pane windows (58 percent). Important differences were an increased emphasis on earth sheltering (51 percent) and a decreased use in energy-efficient appliances (43 percent).

Approximately half of the architects estimated that passive solar heating and energy-efficient appliances are presently used in more than 10 percent of the buildings in their area. Those techniques that most architects thought were least used include superinsulation, active solar heating, double envelope construction, air-to-air heat exchangers, earth sheltering and high efficiency furnaces.

Consumer requirements motivate architects to use energy-efficient techniques, materials, and products. This is the same motivation found among builders. The energy design that more than 65 percent of the architects thought enhanced the salability of buildings was passive solar heating, followed closely by solar greenhouses, which were rated most desirable by 47 percent of the respondents.

A contrast with builders surveyed is the fact that approximately 82 percent of the architects are not involved in selling the buildings they design, whereas 37 percent of the builders are involved in marketing their product. Consequently, almost none of the architects indicated that they use any energy-efficient techniques as selling points.

Architects also indicated that installation of many of the energy-efficient techniques would make significant increases in the cost of construction. In particular, 90 percent of the architects felt that active solar heating or double envelope construction would increase construction costs by as much as 20 percent. Furthermore, 60 to 75 percent felt that standard insulation, passive solar heating, double-pane windows, air-to-air heat exchangers, energy-efficient appliances, and high efficiency furnaces could increase the cost as much as 9 percent. The persons most familiar with construction costs indicated significantly increased expenditures would be required to fully utilize the most effective renewable energy and energy conservation measures.

A significantly high portion (56 percent) of the architects favored the adoption of a home energy rating system similar to the EPA mileage system.

Architects have been very involved in professional meetings and workshops with energy conservation, as more than 72 percent reported attending at least one such meeting during the past year. This endorsement of energy conservation is further reinforced by the fact that 93 percent of the respondents would attend energy related workshops and 69 percent would be willing to pay for these workshops. This is the highest endorsement of energy workshops by any of the nine groups surveyed. Ninety-seven percent of the architects have found useful information on energy conservation in their professional publications, while 94 percent reported ordinary magazines as containing useful information. Architects found little useful information in the standard media--radio, television and newspapers.

Seventy-one percent of the architects surveyed indicated that they primarily designed commercial buildings. Consequently, it is apparent that energy conservation to be achieved through increased awareness and cooperation of architects will be in the commercial sector of the economy. It follows that any major impact on energy conservation in residential structures must be achieved through the consumers and the builders.

G. Lenders

Nearly 60 percent of the lenders indicated that they thought superinsulation would result in at least a 25 percent energy consumption savings. This opinion is backed up by the 90 percent of the lenders that would provide financial support for those dwellings constructed with superinsulation. Similarly, 50 percent of the lenders felt that active solar heating would provide an energy savings of at least 25 percent, and 70 percent of the lenders indicated a willingness to loan money on either active or passive solar heating.

Generally, the respondents from the banks, savings and loans, and credit unions were somewhat familiar with utility company loan programs and viewed these programs as only marginally successful in

contributing to reduced residential energy costs. The lenders also indicated only a mild familiarity with federal energy tax credits to homeowners and very little knowledge of federal energy tax credits to financial institutions.

Lenders endorsed the adoption of a home energy rating system by almost the same proportions as did architects and builders. This endorsement by 55 percent of the respondents would indicate that such a rating system would be widely accepted by the furnishers of residential dwellings. Approximately 80 percent of the lenders indicated that they find their information on conservation and renewable energy from televisions, newspapers and magazines. They also rated the information from these sources as being the most useful way to deliver energy information.

Very few of the lenders have attended any workshops or meetings dealing with energy conservation during the past year as more than 80 percent had not attended any such event. They did, however, express a strong interest, as 83 percent were willing to attend such workshops and the majority were willing to pay for these workshops.

Overall, the lenders differ very little from the general public in their conceptions of energy conservation. They have, however, expressed a strong willingness to provide financial support for energy efficient technology used in residential construction.

H. Appraisers

The appraisers reflected an attitude concerning energy consumption similar to that of the lenders. They believe that superinsulation and solar heating can reduce energy consumption by at least 25 percent. The two conservation factors they think have the greatest impact on home values are standard insulation and multiple-pane windows. Approximately 30 percent of the appraisers thought that these two measures would have a great effect on property values. Those conservation measures that appraisers indicated would have the least effect on property values included energy-efficient appliances, air-to-air heat exchangers, passive solar heating, solar greenhouses, and double envelope construction. All of these conservation measures were rated by less than 10 percent of the appraisers as having a large effect on increased property values.

The appraisers, like the lenders, indicated a general lack of knowledge concerning utility companies' loan programs. Appraisers also indicated only mild familiarity with current state and federal energy building standards. This, however, did not prevent 56 percent of the appraisers from expressing the opinion that these building codes should be left as they are.

Exactly the same proportion of appraisers (56 percent) as other groups of respondents surveyed endorsed the adoption of a home energy rating system similar to the EPA mileage rating system.

An extremely high proportion of appraisers (98 percent) have obtained information on conservation and renewable energy from their professional associations and publications. Their secondary energy information source is magazines (82 percent), closely followed by newspapers (73 percent).

Approximately one-half of the appraisers have attended a professional meeting or workshop on energy conservation, and more than 90 percent would be willing to attend such a meeting in their area. The appraisers exhibited a strong willingness to pay for the cost of these workshops themselves (53 percent), while approximately 15 percent thought the utility companies should pay and a similar percentage felt that these workshops should be the financial responsibility of a government agency.

I. Realtors

Realtors exhibited precisely the same feelings concerning the effectiveness of superinsulation and solar heating in reducing energy consumption as did lenders and appraisers. Between 50 and 60 percent of the respondents thought that at least a 25 percent reduction in energy consumption could be accomplished through these technologies. They also exhibited high confidence (87 percent) that the use of superinsulation increased the salability of homes. A further similarity is that over 60 percent believed that the use of either passive or active solar heating would increase the salability of homes.

The realtors were similar to the lenders and appraisers in having only a mild familiarity with the utility companies loan programs and in believing that these programs have been only marginally effective in reducing energy consumption. This same likeness extends to their knowledge of federal and state energy and property tax exemption programs and the effectiveness of these programs in reducing energy use. They are only mildly familiar with the programs and feel that they have been only marginally effective.

Seventy-eight percent of the realtors expressed little or no familiarity with state and federal building standards; nevertheless, 52 percent expressed the opinion that these building codes should be left as they are.

There is no clear majority of support for a home energy rating system with the realtors. Exactly half supported the idea and 3 percent did not respond to this question.

Superinsulation and multiple-pane windows were identified as those features that add a great deal to the salability of homes. Those factors that were not perceived as increasing the salability include air-to-air heat exchangers, solar greenhouses, solar heating, double envelope construction, and energy-efficient appliances. As with the appraisers, those factors with which builders and architects found the greatest favor were perceived as having the lesser effect on the salability of the finished product.

Realtors have obtained useful information on energy technology from nearly every source. More than 70 percent identified professional publications, television, newspapers, and magazines as important sources.

While realtors have thus far attended few energy workshops (65 percent have attended none at all) 85 percent indicated a willingness to participate in professional meetings related to energy conservation if held in their area. Forty-eight percent thought the participants should pay for these workshops and 27 percent indicated it was the utility companies' responsibility to pay for the workshops.

IV. DNRC ACTION BASED ON SURVEY RESULTS

The Department of Natural Resources and Conservation has incorporated the results of these surveys into its program plans for 1983 and 1984. These actions are listed below:

A. Farmers and Ranchers

Based on the relatively large number of irrigators who indicated they were not planning to use any energy-efficient irrigation techniques, DNRC has planned five irrigation workshops in conjunction with the Montana Cooperative Extension Service. The workshops will cover techniques that can be used with existing systems, such as efficient timing schedules, and also new equipment, such as low-pressure pumps. Irrigation is one of the major areas of energy consumption in Montana agriculture, and there are significant potential savings of both money and energy through irrigation conservation practices. DNRC also will prepare an in-depth feature article on irrigation energy savings for distribution to the Montana Farmer-Stockman and the Montana Rural Electric News. Additional copies of this article will be sent to newspapers across the state and will be available at major agricultural expositions attended by DNRC staff.

DNRC is also preparing slide-shows and introductory booklets on wind energy and small-scale hydroelectricity, both of which are relevant in many agricultural settings across Montana. This information will be distributed at fairs and at the 30 Energy Information Centers across Montana, sponsored by DNRC and run by the Cooperative Extension Service. In addition, DNRC is preparing slide-tape programs on wind and small-scale hydropower, which will be available on request for presentation to various groups.

- B. Large and small business -- Private business continues to be one of the most difficult groups to effectively reach with government energy programs. In the past, DNRC has used local civic organizations as a means for disseminating information to this sector; however, civic groups were rated quite low by both large and small businesses as an information delivery mechanism.

DNRC will continue two of its more successful workshops -- energy efficient lighting and boiler efficiency. Lighting workshops have been attended by both large and small businesses in the past; energy efficient lighting represents an area of good potential savings for both large and small businesses. Boiler efficiency also represents an area of high potential savings, but it is usually only relevant to larger businesses.

Because of the diversity among businesses, it is difficult to disseminate information that is relevant to each business. Still, DNRC usually has access to a wide variety of energy information that could be of use in different industries. Because mass media rated so highly as a means of reaching people from both large and small businesses, DNRC will increase its newspaper, radio and television use in an attempt to make people more aware of the services available.

- C. Builders -- Builders in Montana have indicated an interest in cost-effective renewable energy and conservation technologies. Based on the findings of the survey, DNRC has planned three workshop series in 1983 and 1984.

DNRC will conduct five workshops on passive solar construction for builders in early 1984. The one-day workshops will cover site evaluation, thermal storage requirements and building techniques. Sample floor plans for passive solar houses will also be available.

Depending on interest, DNRC is also planning four workshops on installation of solar domestic hot water systems. The workshops would be open to solar contractors across Montana and would cover installation techniques, materials, problems and solutions.

DNRC also will sponsor a series of live and videotaped workshops on solar and conservation retrofits to existing houses. These workshops, intended for contractors and homeowners, will cover insulation and superinsulation retrofits, active air and liquid solar systems, passive solar retrofits, insulated shades and shutters, air-to-air and grey water heat exchange, and determining the economic viability of each retrofit. The workshops will be conducted through the Telecom video network of the College of Great Falls during 1984, and will be based on a retrofit handbook scheduled for publication by DNRC in early 1984.

- D. Architects -- DNRC has no workshops planned specifically for architects, although they may benefit from the various builders workshops mentioned above. Instead, DNRC plans to increase its presentations at regularly scheduled meetings, such as local and state chapters of the American Institute of Architects. Also, DNRC will use professional journals to increase awareness of its services.
- E. Lenders -- DNRC will continue and increase involvement of financial institutions across Montana through its renewable energy loan program, a joint venture between state government and the private

financial community. In addition, DNRC is planning a financing workshop during the fall of 1983; this workshop would discuss financing options for cost-effective conservation improvements on an institutional and municipal scale. Conventional and alternative financing mechanisms will be covered, and DNRC will encourage the participation of financial institutions in the workshop.

- F. Appraisers -- DNRC will continue and increase its presentations at regular meetings of Montana appraisers. Also, the department will work to involve interested appraisers in the proposed Residential Energy Efficiency Rating system and with proposed changes in the state building codes.
- G. Realtors -- DNRC will continue and increase its presentations at regular meetings of Montana realtors, and will work to involve realtors in the rating system and any building codes changes. Although realtors indicated support for maintaining or strengthening Montana's building codes, a significant portion indicated a desire to relax the state's energy codes. Because of this interest, it becomes increasingly important to involve realtors in potential code modifications.
- H. General public -- Several activities planned by DNRC are a direct result of information received from this survey.

A surprisingly high percentage of those surveyed indicated they had caulked and weatherstripped their homes (78 percent). Sixty-eight percent had adequate insulation levels, and 75 percent had turned down their thermostat. Because of this high level of activity, DNRC will reduce its strong emphasis on these low-cost or no-cost conservation efforts and will work to maintain this level rather than devote significant time and money toward increasing awareness of these activities.

The one exception is hot water tank insulation. Only one-third of those surveyed had wrapped their water heaters, despite the relatively low cost (\$10 or less), the extremely good payback (usually 1-3 years) and the ease of installation (about one-half hour's time). Because of these factors, DNRC will undertake a major advertising campaign this fall and winter to encourage hot water tank and pipe insulation and hot water thermostat setback. The campaign will include mass media advertising and will promote brochures on hot water conservation prepared by DNRC.

Montanans also indicated a low awareness of energy audit and loan programs conducted by utilities. Forty-three percent of those surveyed were unfamiliar with the programs, 86 percent have not had a free energy audit conducted, and 95 percent have not taken advantage of the zero-interest loans offered. DNRC will encourage participation in these programs through its various outreach and advertising efforts.

The survey also pointed out technologies that were of interest to Montanans, and areas where people would like to receive more information. To meet this need, DNRC is preparing introductory brochures and slide-tape shows on the following technologies: geothermal energy, small-scale hydropower, wind energy, alcohol fuels, superinsulation, solar greenhouses, solar domestic hot water heaters, earth sheltered housing, insulated window coverings, efficient woodburning, Russian fireplaces, heat pumps, appliance efficiency and methane fuel. These brochures will be available at DNRC's 30 Energy Information Centers across Montana and will be advertised through news releases and radio and television public service announcements.

Appendix C

Draft presentation--Livers

Coal Issues Workshop

For June 29, 1984

This Appendix is included mainly to reveal DNRC's relationship with the banking community concerning the (RECP program).

MONTANA'S RENEWABLE ENERGY AND CONSERVATION PROGRAM

Back in 1980 the Department of Natural Resources and Conservation took a serious look at its Renewable Energy Program. There were significant changes occurring in energy, and it was a different world from when the program began in 1976. Renewable energy technology was advancing. Conventional fuel prices were rising. Some of these new technologies evolved from exotic experiments into cost-effective alternatives. As a result, renewable energy businesses gradually emerged.

DNRC's program was originally designed to sponsor research and small-scale demonstration projects in solar, wind, geothermal, microhydro and biomass energy. In 1979, the Legislature removed the program's ban on funding commercial activities. At DNRC's request, the 1981 Legislature authorized a loan program to encompass commercial ventures and projects with income-generating potential.

The loan program, administered through the state's private financial institutions, allows us to nurture a project through research and development, on to demonstration and, finally, commercialization. We're no longer faced with a situation where we have to drop a technology as soon as it begins to look commercially feasible. Instead, through the loan program, we can directly stimulate these new businesses and thus help foster the renewable energy industry.

The DNRC loan program represents a cooperative venture between state government and the private financial community. When we first set up the program, we recognized that we knew energy, but we weren't financial experts. Similarly, the banks knew how to determine good credit risks but couldn't evaluate whether a project was technically sound.

We set up a system that seems to work pretty well. Loan applications are submitted to the Department, where we review them for technical soundness, compatibility with program goals, and potential public benefits. Applicants that pass this stage are authorized to contact the lending institution of their choice to arrange financing. The bank or other lending institution then performs all credit checks and other loan origination work, including the acquisition of all necessary security for its and DNRC's loan shares.

If the lending institution approves the loan, DNRC will provide up to 90 percent of the loan principal at the current Federal Reserve discount rate, subject to available funds. The participating financial institution provides the remaining principal at its customary interest rate, considering the size of the proposal and the risk associated with it. The maximum repayment period for a renewable energy loan is 10 years, and the loan may not be used to refinance existing debts.

This partnership approach offers several benefits. First, it combines the technical expertise of DNRC's engineers and renewable energy specialists with the financial expertise of the private lending institutions. Second, it's helped DNRC develop a solid working relationship with the financial community in Montana. Finally, it's helped to leverage private capital and to get the banks involved in an area that's relatively new and unfamiliar to them.

The involvement of the private sector in conservation and renewable energy is vital to long-term development of these technologies. Ultimately, these resources must be able to compete in the free market, with the support of both private developers and lenders. In many parts of the country, investors are realizing the cost-effectiveness of these technologies and are financing them through innovative, third-party options such as shared savings and third-party leasing.

The real benefit of the Renewable Energy and Conservation Program is that it's stimulating an emerging industry in Montana by helping to finance new or expanding businesses. During the 1982-1983 biennium, DNRC has awarded 26 grants, for total of \$771.450. and 12 loans, for a total of \$1.482.640.

A complete list of renewable energy projects is available from DNRC. Recent grant projects include: innovative solar heating systems for the Missoula Senior Citizens' Center and the Park City School; a highly successful small hydropower system south of Livingston, which is currently being considered for expansion under a DNRC loan; a solar water heater test program; and a handbook and workshop series on renewable energy systems that can be incorporated into existing homes.

Loan activities financed in 1982 and 1983 include: operating and construction expenses for a small-scale alcohol fuel plant near Terry, commercial hogfuel chip production from forest thinnings near Missoula, and operating and construction expenses for a densified wood fuel plant in Livingston.

At present, businesses in every major renewable energy field have been established in Montana. The conservation industry is well established, and numerous solar businesses have operated in Montana for several years. A \$15,000 renewable energy loan to SunCraft in Bozeman provided operating and expansion capital for

two business partners, enabling them to become the state's first installers of highly efficient, state-of-the-art, evacuated tube solar collectors. Several Montana engineers have been involved in designing and building geothermal heating systems, and a geothermal-powered electrical generating plant is planned for Ennis.

With proper planning, renewable energy projects are environmentally benign. Most of the businesses that have emerged are Montana-based. In some cases, renewable energy businesses are extremely compatible with existing industries, such as agriculture. Wind and small hydropower are being considered more and more by landowners as "cash crops" -- ways to turn their resources into income -- although lower purchase rates for electricity from small producers will slow development in the near term.

The renewable energy resource that has shown the most promise thus far for primary industry development in Montana is biomass -- specifically wood waste and alcohol fuel. We're also sponsoring research in production of diesel substitutes and fuel extenders from oil seeds such as sunflower and safflower. Substandard grain is being sold as feedstock for ethanol production, and many farmers are considering using their marginal land for planting high-starch crops such as Jerusalem artichokes.

Four commercial alcohol fuel plants have been established in Montana. A.E. Montana, Inc., in Amsterdam was Montana's first commercial plant, coming on line in Fall, 1981. It employs more than a dozen people and has a rated capacity of 1.2 million gallons per year. It was followed a month later by Alcotech, near Ringling, the state's largest producer at 1.5 million gallons per year. There are two smaller plants in Montana, each with a capacity of about 200,000 gallons per year -- Bronco Fuel Company near Geraldine, and Sage 'N Cedar, near Terry. With the exception of Alcotech, all of these plants have received renewable energy loans.

The market for ethanol in Montana is very good. In fact, producers are having trouble keeping up with the current demand. A by-product of the fermentation process, distiller's grains, is sold wet as fertilizer or stillage, or dry as livestock feed supplement. One firm -- Alcofeed, in East Helena-- has been established for the sole purpose of marketing this by-product. In addition, DNRC recently awarded a grant to Renewable Technologies, Inc., of Butte, to continue its research on an enzyme process to produce alcohol fuel from grain without cooking. This process, if successful, could be a boon to the ethanol industry, reducing production costs several cents per gallon and thus increasing gasohol's competitiveness with gasoline.

Wood waste also represents a significant energy resource in Montana. Collins Enterprises, developers of the nationally-marketed Collins Hopper, has received a \$115,000 renewable energy loan to help finance construction of a wood waste fuel plant in Livingston. The plant, which opened in March, produces densified wood pellet fuel from waste generated by the wood products industry. The fuel is intended primarily for residential and institutional use, but it has good potential for industrial applications as well. A related DNRC loan of \$35,000 is being used to retrofit A.E. Montana for burning wood pellets as its process heat source for ethanol production. This retrofit will significantly reduce operating expenses for the alcohol plant while helping to provide a solid base market for the new wood pellet plant.

Appendix D

90-4-101

PLANNING, RESEARCH, AND DEVELOPMENT

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Part 1

Renewable Energy Sources Research and Development

Part Cross-References

Tax credit for installing alternative energy system, Title 15, ch. 32, part 2.

Coal tax to alternative energy research and renewable resource development, 15-35-108.

Development, protection, and conservation of forest, range, and water resources, 76-13-104.

90-4-101. Purpose. The purposes of this part are to stimulate research, development, and demonstration of energy conservation and of energy sources which are harmonious with ecological stability by virtue of being renewable, thereby to lessen that reliance on nonrenewable energy sources which conflicts with the goal of long-range ecological stability and to provide for the funding and administration of such research. Furthermore it is the purpose of this part to stimulate the commercialization of alternative renewable energy and to allow the department to make loans through financial institutions in Montana for this purpose.

History: En. 84-7407 by Sec. 1, Ch. 501, L. 1975; R.C.M. 1947, 84-7407; amd. Sec. 1, Ch. 624, L. 1979; amd. Sec. 1, Ch. 356, L. 1981; amd. Sec. 1, Ch. 98, L. 1983.

Compiler's Comments

1983 Amendment: Near beginning, substituted "and demonstration of energy conservation and of energy sources" for "demonstration and commercialization of energy sources"; in second sentence, inserted "to stimulate the commercialization of alternative renewable energy and"; at end of second sentence substituted "this purpose" for "commercialization of alternative renewable energy".

1981 Amendment: Inserted "and commercialization" before "of energy sources" in the first sentence; added the last sentence.

Cross-References

Tax credit for installing alternative energy system, Title 15, ch. 32, part 2.

Coal tax to alternative energy research and renewable resource development, 15-35-108.

Financial Institutions, Title 32.

Montana Environmental Policy Act, Title 75, ch. 1.

Solid waste management or material recycling, Title 75, ch. 10.

Development, protection, and conservation of forest, range, and water resources, 76-13-104.

Geothermal resources, Title 77, ch. 4, part 1.

Water resource development, Title 85, ch. 1.

90-4-102. Definitions. As used in this part, the following definitions apply:

(1) "Alternative renewable energy source" means a form of energy or matter, such as solar energy, wind energy, or methane from solid waste, capable of being converted into forms of energy useful to mankind, and the technology necessary to make this conversion, when the source is not exhaustible in terms of this planet and when the source or the technology are not in general commercial use.

(2) "Energy conservation" means reducing waste or dissipation of energy or reducing the amount of energy required to accomplish a given quantity of work through increases in efficiency of energy use, production, or distribution.

(3) "Person" means a natural person, corporation, partnership, or other business entity, association, trust, foundation, any educational or scientific institution, or any governmental unit.

(4) "Department" means the Montana department of natural resources and conservation.

History: En. 84-7408 by Sec. 2, Ch. 501, L. 1975; R.C.M. 1947, 84-7408; amd. Sec. 2, Ch. 98 L. 1983.

Compiler's Comments

1983 Amendment: Inserted (2).

90-4-103. Alternative energy and energy conservation research development and demonstration account established. There is within the state special revenue fund an alternative energy and energy conservation research development and demonstration account. Monies are paid into this account under 15-35-108. The state treasurer shall draw warrants payable from this account upon order of the department.

History: En. 84-7409 by Sec. 3, Ch. 501, L. 1975; R.C.M. 1947, 84-7409; amd. Sec. 3, Ch. 98, L. 1983; amd. Sec. 1, Ch. 277, L. 1983.

Compiler's Comments

1983 Amendment: Chapter 98 inserted "and energy conservation" after "alternative energy".

Chapter 277 substituted reference to state special revenue fund for reference to earmarked revenue fund.

Cross-References

Fund structure, 17-2-102.

90-4-104. General powers of department. The department may:

- (1) employ a staff adequate to administer this part;
- (2) retain professional consultants and advisors;
- (3) adopt rules governing applications and granting of funds;
- (4) adopt rules governing applications for and administration and awarding of loans;
- (5) consider applications and award grants or loans, subject to the availability of funds and to the appropriation of such funds by the legislature, from the alternative energy and energy conservation research development and demonstration funds for projects that will further the purposes of this part;
- (6) appoint an alternative energy advisory committee composed of representatives of state agencies and citizen members with expertise in alternative energy and energy conservation matters. The appointment of any such advisory committee shall be in keeping with 2-15-122.

History: En. 84-7410 by Sec. 5, Ch. 501, L. 1975; R.C.M. 1947, 84-7410; amd. Sec. 2, Ch. 356, L. 1981; amd. Sec. 4, Ch. 98, L. 1983.

Compiler's Comments

1983 Amendment: In (5) and (6), inserted "and energy conservation" after "alternative energy".

1981 Amendment: Inserted subsection (4); deleted "for grants" after "applications" in (5); inserted "or loans" after "award grants" in (5).

90-4-105. Applications for grants or loans. Any person may apply for a grant to enable him to research, develop, or demonstrate energy conservation or alternative renewable energy sources. Any person may apply for a loan to commercialize alternative renewable energy sources. The department shall prescribe the form for applications. Applicants shall describe the nature of their proposed investigations, including practical applications of the possible results and time requirements.

History: En. 84-7411 by Sec. 6, Ch. 501, L. 1975; R.C.M. 1947, 84-7411; amd. Sec. 3, Ch. 356, L. 1981; amd. Sec. 5, Ch. 98, L. 1983.

Compiler's Comments

1983 Amendment: Near beginning of first sentence, deleted "or loan" after "grant"; substituted "develop, or demonstrate energy conservation or alternative renewable energy sources" for "develop, demonstrate, or commercialize alternative renewable energy sources"; and inserted second sentence.

1981 Amendment: Inserted "or loan" after "grant" in the first sentence; inserted "or commercialize" after "demonstrate" in the first sentence.

Cross-References

General powers of Department, 90-4-104.

90-4-106. Criteria for grant or loan awards. The department may award grants or loans to applicants under 90-4-105 in accordance with the following criteria:

(1) A grant may cover a period exceeding 1 year, provided that all funds for the grant must be encumbered or accrued from the program appropriation for the year the grant is authorized.

(2) The department may give preference to projects which are also supported by funding from the federal government or other persons, provided the projects are consistent with the other objectives of the department. The purpose of this preference is to use the alternative energy and energy conservation research development and demonstration account for matching monies in order to support more substantial research or commercialization.

(3) The department may give preference to research centers unattached to existing educational institutions where several investigators can share supporting services. However, this shall not be interpreted to prohibit the department from awarding grants or loans to existing educational institutions.

(4) The department may give preference to research centers which make information available to individuals, small businesses, and small communities seeking the use of renewable energy sources and energy conservation in their homes, plants, places of business, and small communities.

(5) All information resulting from such research shall be made available to the public.

(6) The department may expend or commit available alternative energy and energy conservation research development and demonstration funds. The department may commit funds for demonstration purposes only when in its judgment such expenditures or commitments have good potential for producing savings of nonrenewable energy sources. The department may not commit funds for demonstration purposes when any of the following conditions are present:

- (a) previous commitments of a similar nature were not productive;
- (b) a similar demonstration has been conducted within close geographic proximity of the geographic location of the proposed demonstration project;
- (c) the proposed demonstration project would not further the purpose of this part.

History: En. 84-7412 by Sec. 7, Ch. 501, L. 1975; R.C.M. 1947, 84-7412; amd. Sec. 4, Ch. 356, L. 1981; amd. Sec. 1, Ch. 402, L. 1981; amd. Sec. 6, Ch. 98, L. 1983.

Compiler's Comments

1983 Amendment: In (1), deleted "not" before "exceeding 1 year"; substituted language after "1 year" for "and the department may not commit itself to spending funds anticipated to be available more than 1 year after the grant period begins. The department may give an applicant a statement of intent to renew its support of his work, subject to the availability of funds and such other conditions as the department may express"; in (2) and (6), inserted "and energy conservation" after "alternative energy" and in (4) after "renewable energy sources"; at end of (5), deleted "and shall not become the

private property of or under the exclusive control of any one company or person".

1981 Amendments: Chapter 356 inserted "or loans" after "grants" in the first sentence and in (3); substituted "funding" for "grants" in the first sentence of (2); substituted "projects" for "grants" in the first sentence of (2); added "or commercialization" at the end of (2).

Chapter 402 changed "is under no requirement to" to "may" near the beginning of (6); inserted "The department may commit funds for demonstration purposes only" at the beginning of second sentence of (6); deleted "would be unproductive" after "commitments" and

added remainder of subsection (6) relating to criteria for and for not committing funds.

Cross-References

Research programs for Montana University System, 20-25-108.

90-4-107. Biennial report. The department shall monitor the grants awarded and shall report its expenditures and other information concerning the implementation and effectiveness of specific projects or programs for which grants were awarded under this part to the legislature at the beginning of each regular legislative session.

History: En. 84-7413 by Sec. 8, Ch. 501, L. 1975; R.C.M. 1935, 84-7413; amd. Sec. 2, Ch. 402, L. 1981.

Compiler's Comments

1981 Amendment: Inserted "shall monitor the grants awarded and" after "department"; and changed "other activities" to "other infor-

mation concerning the implementation and effectiveness of specific projects or programs for which grants were awarded".

90-4-108. Oversight function of environmental quality council. The department shall submit periodic reports to the environmental quality council established in 5-16-101 for review and evaluation. The environmental quality council shall make such recommendations as it considers necessary to assure the greatest possible benefit of the program to the people of the state as a whole. Such recommendations may include proposals for legislation.

History: En. Sec. 3, Ch. 402, L. 1981.

Part 2

Home Weatherization Programs

Part Cross-References

Taxation — energy-related incentives — credits and deductions, Title 15, ch. 32.

90-4-201. Weatherization money consolidated. All federal funds and grants available and becoming eligible to Montana under the provisions of the community services administration's emergency energy conservation program, the federal energy administration's low-income weatherization assistance program, and any other federal funds intended to increase the energy efficiency of dwellings occupied by persons of low and fixed incomes, except for Title XX of the Social Security Act, are to be coordinated and are appropriated to the department of social and rehabilitation services.

History: En. 35-601 by Sec. 2, Ch. 583, L. 1977; R.C.M. 1947, 35-601; amd. Sec. 9, Ch. 274, L. 1981.

Compiler's Comments

1981 Amendment: Substituted "department of social and rehabilitation services" for "department of community affairs".

Cross-References

Taxation — energy-related incentives, Title 15, ch. 32.

90-4-202. Allocation formula. (1) The department of social and rehabilitation services may use not more than 5% of the total weatherization funds for administration of the weatherization program.

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